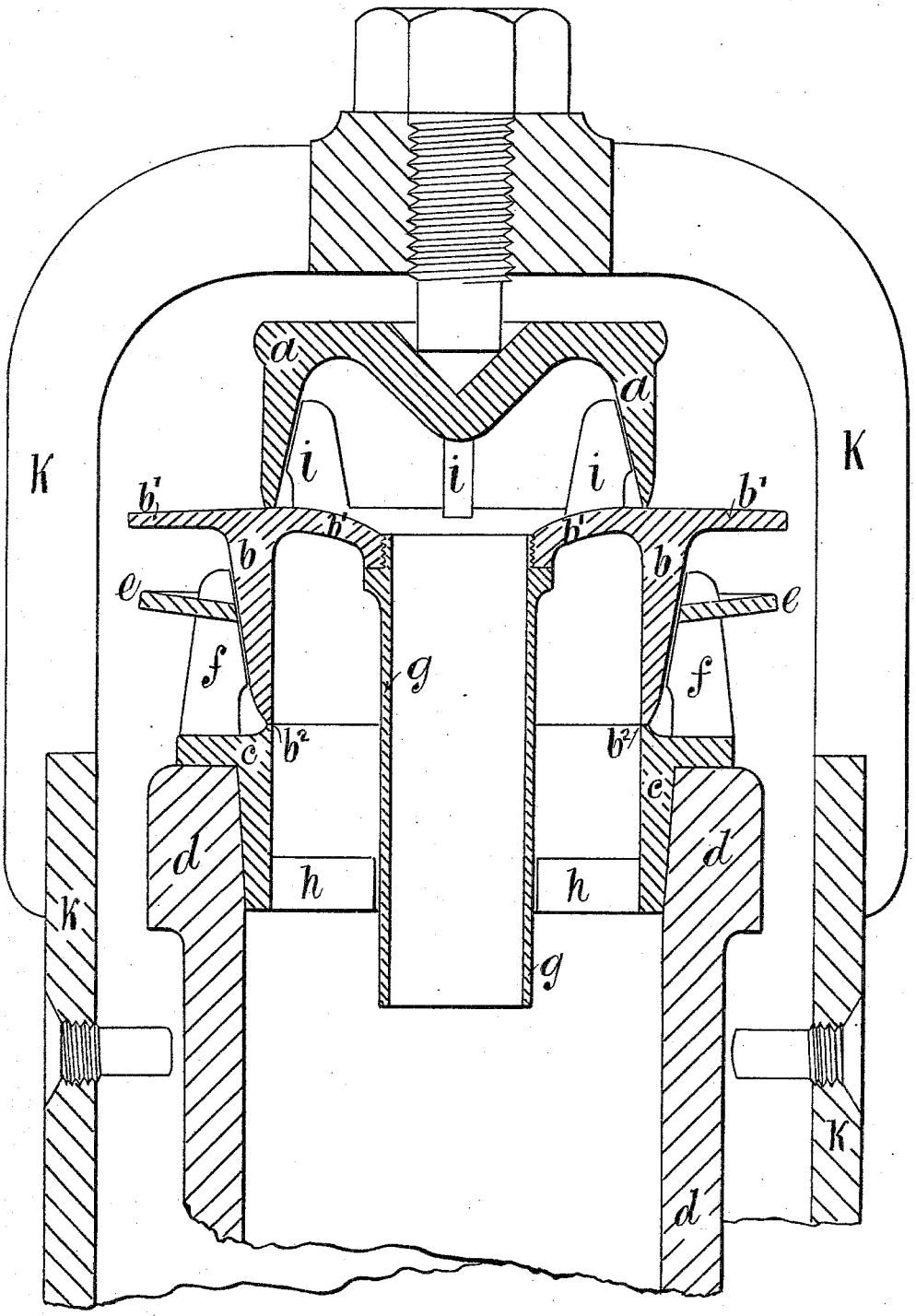
(No Model.)

T. FOSTER.

SAFETY VALVE.

No. 303,273. Patented Aug. 12, 1884.



Witnesses
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UNITED STATES PATENT OFFICE.

THOMAS FOSTER, OF MANCHESTER, COUNTY OF LANCASTER, ENGLAND, ASSIGNOR TO WALTER FITZALLEN SIMPSON, OF SAME PLACE.

SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 303,273, dated August 12, 1884.

Application filed April 1, 1884. (No model.)

To all whom it may concern:

Be it known that I, THOMAS FOSTER, a subject of the Queen of Great Britain, residing at Manchester, in the county of Lancaster, England, engineer, have invented a new and useful Safety-Valve, of which the following is a specification.

My invention relates to improvements in safety-valves; and the object of my improvements is to increase the lift of the valve on blowing off by guiding the issuing steam or other fluid, so as to cause a vacuum or partial vacuum on the upper surface of the valve. I attain this object by the means illustrated in the accompanying drawing, which is a vertical section of my improved safety-valve as adapted to the dead-weight principle; but it may be loaded either by springs or weights in any of the usual ways. I make the valve *a* preferably in the form of an inverted cup, although it may be in other convenient shape. The lip of the valve rests upon a loose seating, *b*, which loose seating forms a lower valve and rests upon an ordinary fixed seating, *c*, secured to and carried by a stand-pipe, *d*. The loose seating *b* is made in the form of a short tube with a flange, *b'*, at the upper end. This flange may vary considerably in size; but I prefer to make it about twice the diameter of the valve when the working or blowing-off pressure is about one hundred pounds to the square inch and a proportionately less diameter for lower pressures. The outer portion of the flange *b'* is so formed that its upper surface lies along and coincides, or nearly so, with the path of the steam or other fluid as it issues from under the lip of the valve *a* when blowing off, or, instead of coinciding with the outer portion of the flange *b'*, may be approximately parallel to the path of the issuing steam or other fluid, so that the pressure of the atmosphere shall be thereby swept from the said upper surface. I prefer to make the face or lip of the valve *a* horizontal, in which case the outer portion of the flange *b'* must also be approximately horizontal, because, when blowing off, the steam or other fluid leaves the valve in a line nearly straight and parallel to the faces of the opening. The lip of the upper valve, *a*, and the lower face or lip of the loose seating *b* need not be broader than is necessary to resist the crushing-strain caused by the load placed upon the valve. I prefer to made the depth of the loose seating *b* about one inch and three-quarters. It may be made much deeper, but need not be deeper than is necessary to prevent the steam or other fluid as it issues from under its lower face from striking the under side of the flange *b'*; nor must the issuing fluid pass so near this flange as to materially reduce the atmospheric pressure beneath it. An annular flange or ring, *e*, may be attached to the guide *f*, for the purpose of further assisting to prevent the issuing fluid from sweeping the atmospheric pressure from the under side of the flange *b'*.

g is a tube which conveys steam or other fluid direct to the valve *a* without reduction of pressure as the fluid passes the opening b^2 when blowing off. The diameter of the tube *g* may be from one-third to one-half the diameter of the valve *a*, and the tube may be made longer than is shown in the drawing, if desired, so as to extend into the steam-space of the boiler or other vessel to which the safety-valve is applied. The tube *g* is secured at the upper end to the loose seating *b*, and the lower end is or may be guided by ribs *h*. The valve *a* is guided by ribs *i*, and is loaded by means of annular weights placed upon a pendulous bonnet, *k*.

Having stated the nature of my invention, and described the manner of performing the same, I declare that what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination, with a safety-valve, *a*, of a loose seating, *b*, having a flange, *b'*, and connected to a tube, *g*, the lower end of said loose seating resting on a fixed seating, *c*, secured to a stand-pipe, *d*, the said stand-pipe communicating with the boiler or other vessel, substantially as herein shown and described, for the purpose specified.

2. In combination with a safety-valve and a lower seating, the loose seating *b*, provided at its upper end with a flange, *b'*, extending be-

yond the body of said seating, and having its upper face in a plane coincident with or parallel to the path of the issuing steam, substantially as set forth.

3. In a safety-valve, the combination, with the loose seating *b*, of the annular flange or ring *e*, substantially as herein set forth, for the purpose specified.

The foregoing specification of my improvements in safety-valves signed by me this 22d day of March, 1884.

THOS. FOSTER.

Witnesses:
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